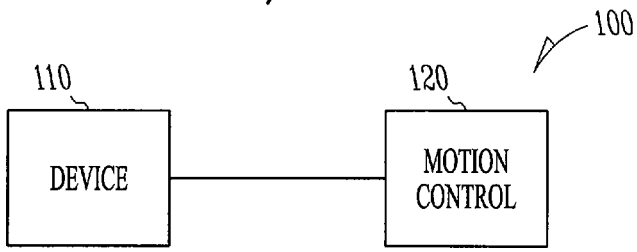


FIG. 1

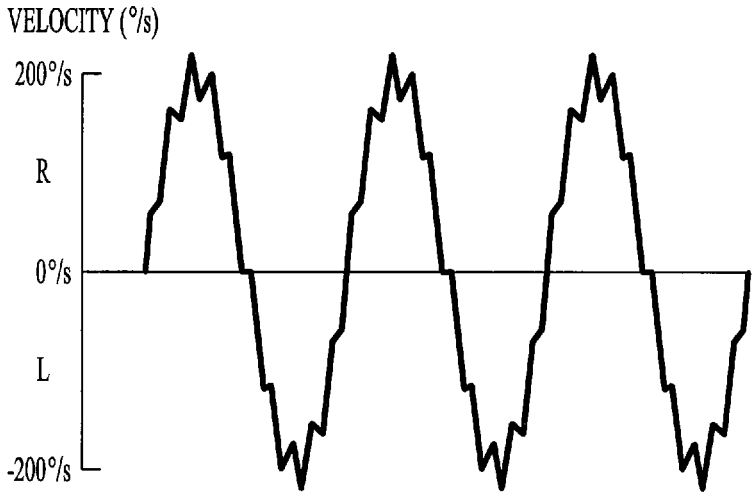


FIG. 2

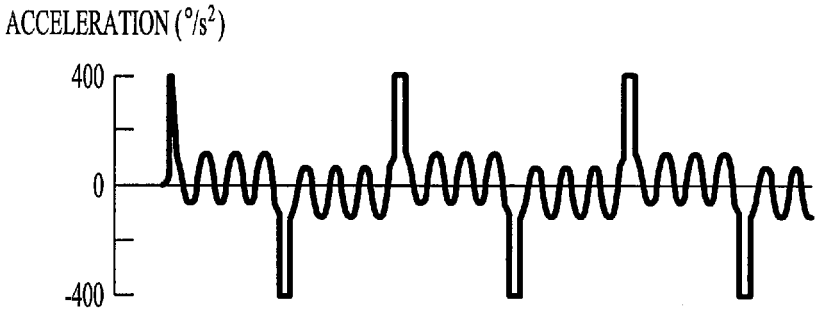


FIG. 3A

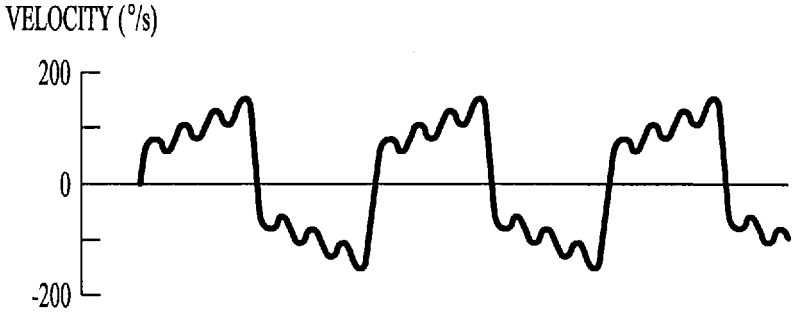


FIG. 3B

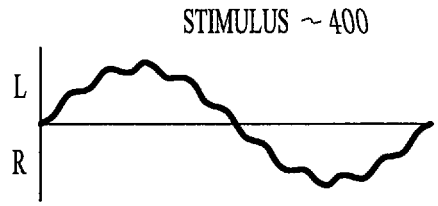


FIG. 4A

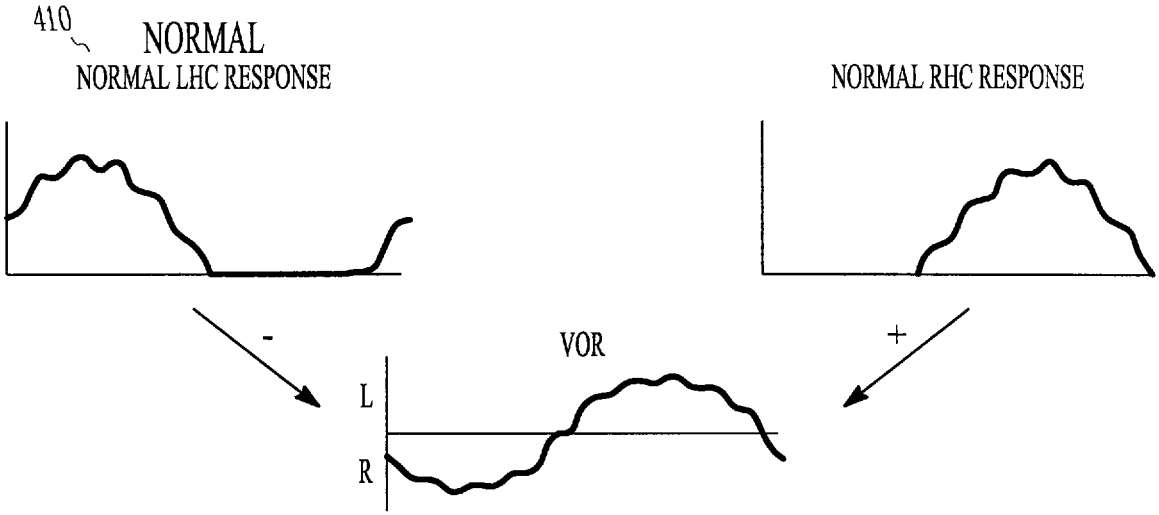


FIG. 4B

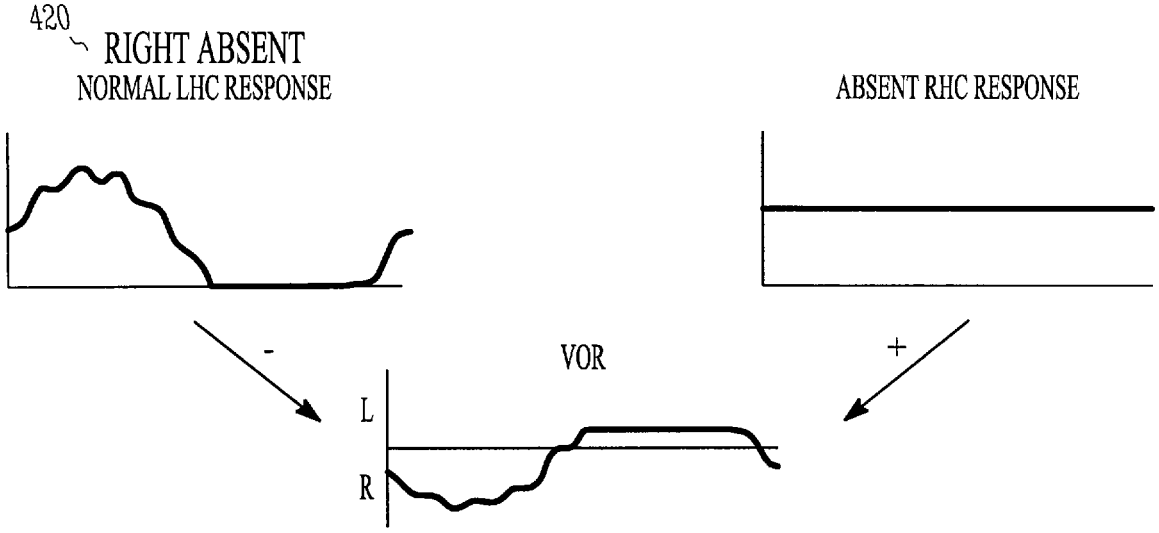


FIG. 4C

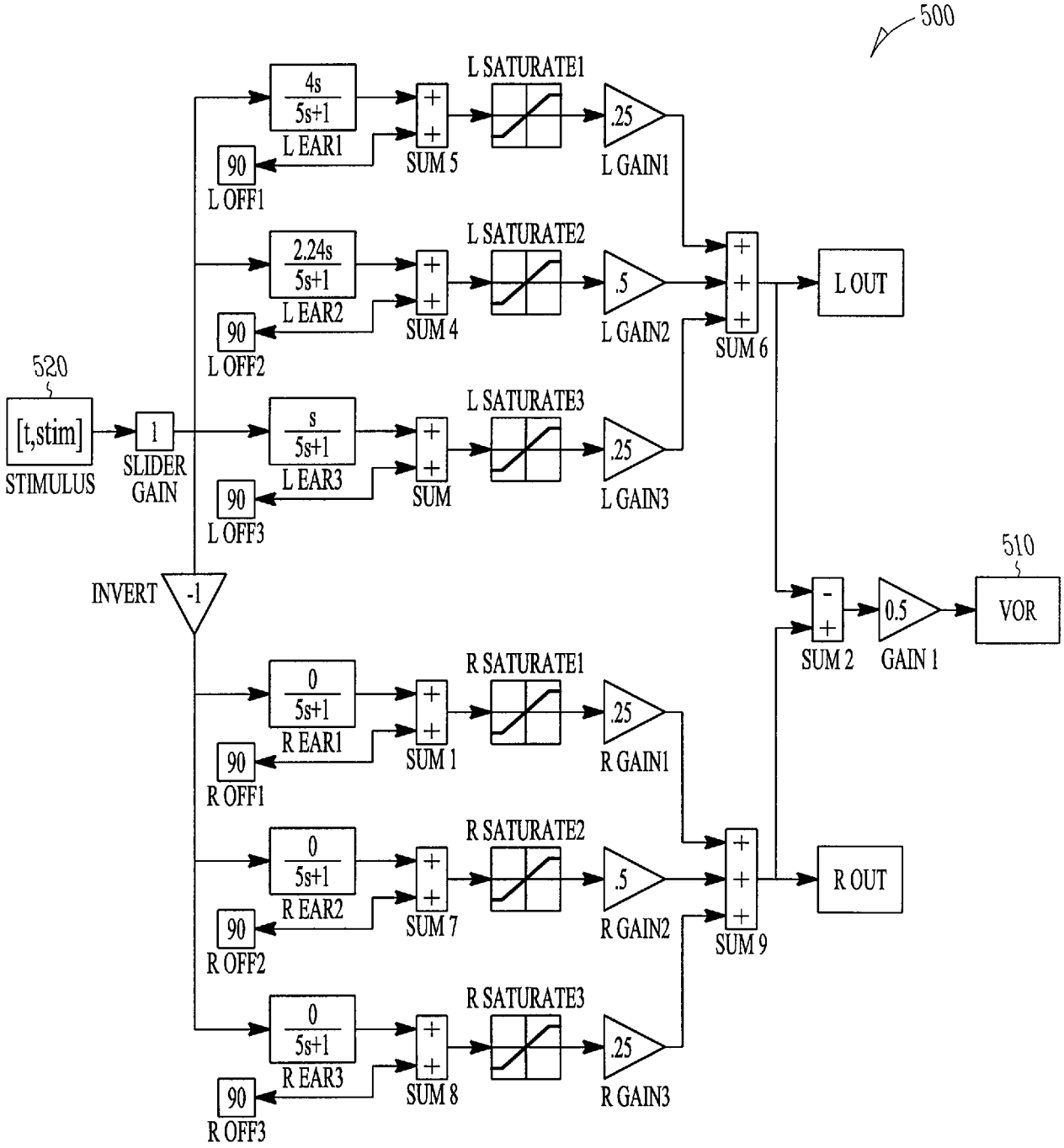

500
L SATURATE1
4s
5s+1
L EAR1
SUM 5
.25
L GAIN1
90
L OFF1
L SATURATE2
2.24s
5s+1
L EAR2
SUM 4
.5
L GAIN2
90
L OFF2
SUM 6
L OUT
520
[t,stim]
STIMULUS
1
SLIDER GAIN
L SATURATE3
s
5s+1
L EAR3
SUM
.25
L GAIN3
90
L OFF3
510
INVERT
-1
SUM 2
0.5
GAIN 1
VOR
R SATURATE1
0
5s+1
R EAR1
SUM 1
.25
R GAIN1
90
R OFF1
R SATURATE2
0
5s+1
R EAR2
SUM 7
.5
R GAIN2
90
R OFF2
SUM 9
R OUT
R SATURATE3
0
5s+1
R EAR3
SUM 8
.25
R GAIN3
90
R OFF3

FIG. 5

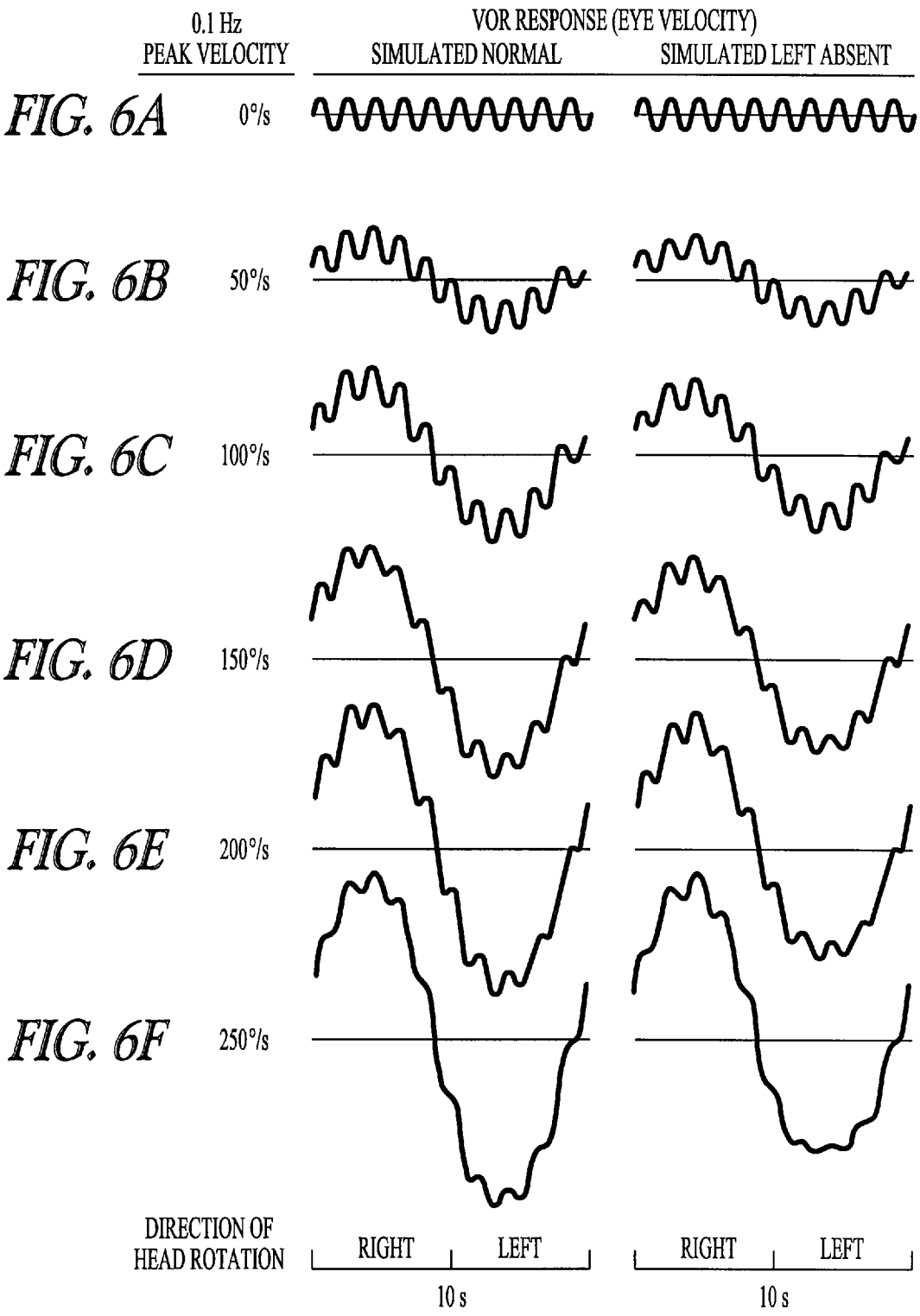


FIG. 6A

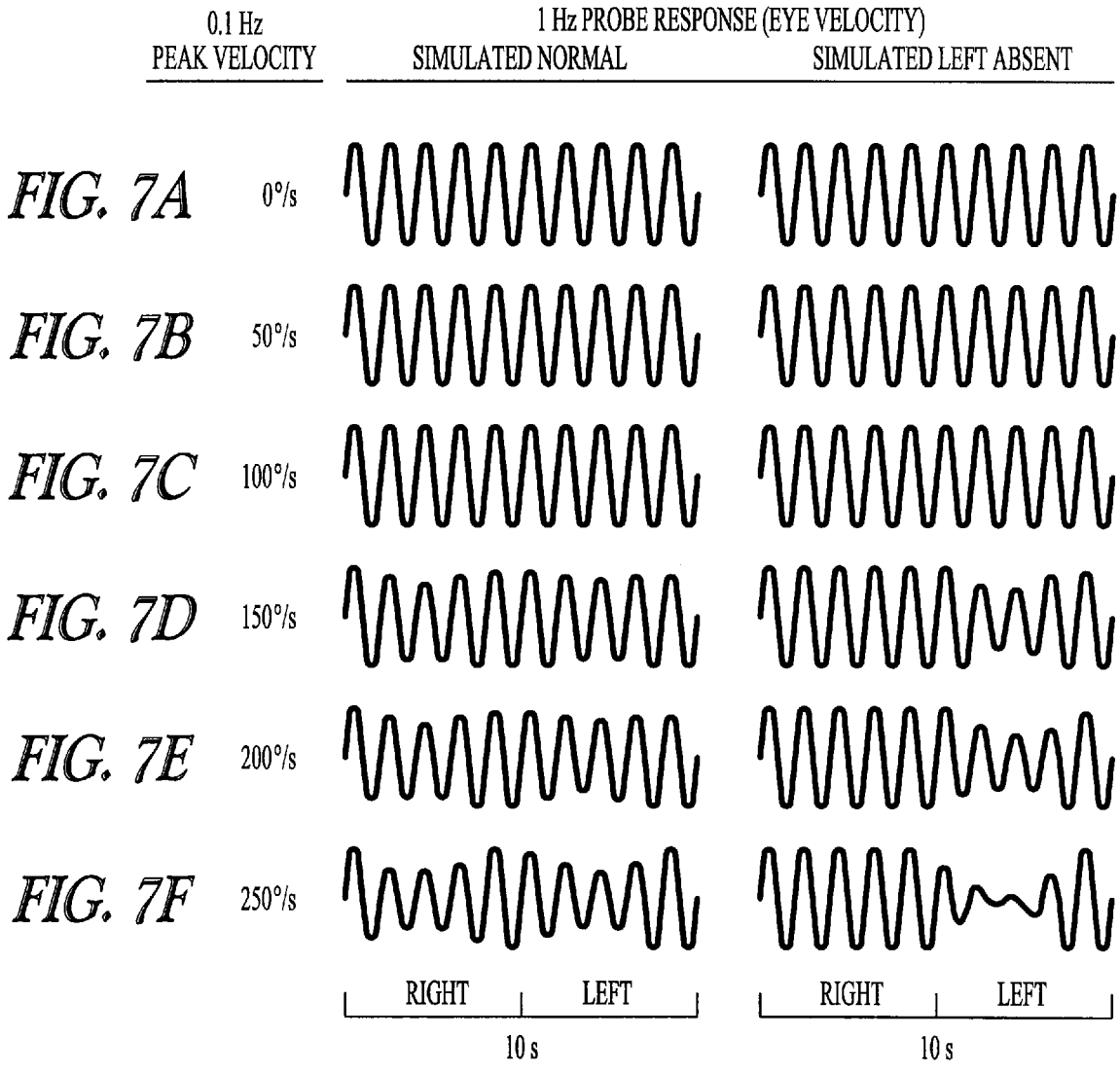
FIG. 6B

FIG. 6C

FIG. 6D

FIG. 6E

FIG. 6F


0.1 Hz
PEAK VELOCITY
1 Hz PROBE RESPONSE (EYE VELOCITY)
SIMULATED NORMAL
SIMULATED LEFT ABSENT
FIG. 7A
0°/s
FIG. 7B
50°/s
FIG. 7C
100°/s
FIG. 7D
150°/s
FIG. 7E
200°/s
FIG. 7F
250°/s
RIGHT
LEFT
10 s
RIGHT
LEFT
10 s

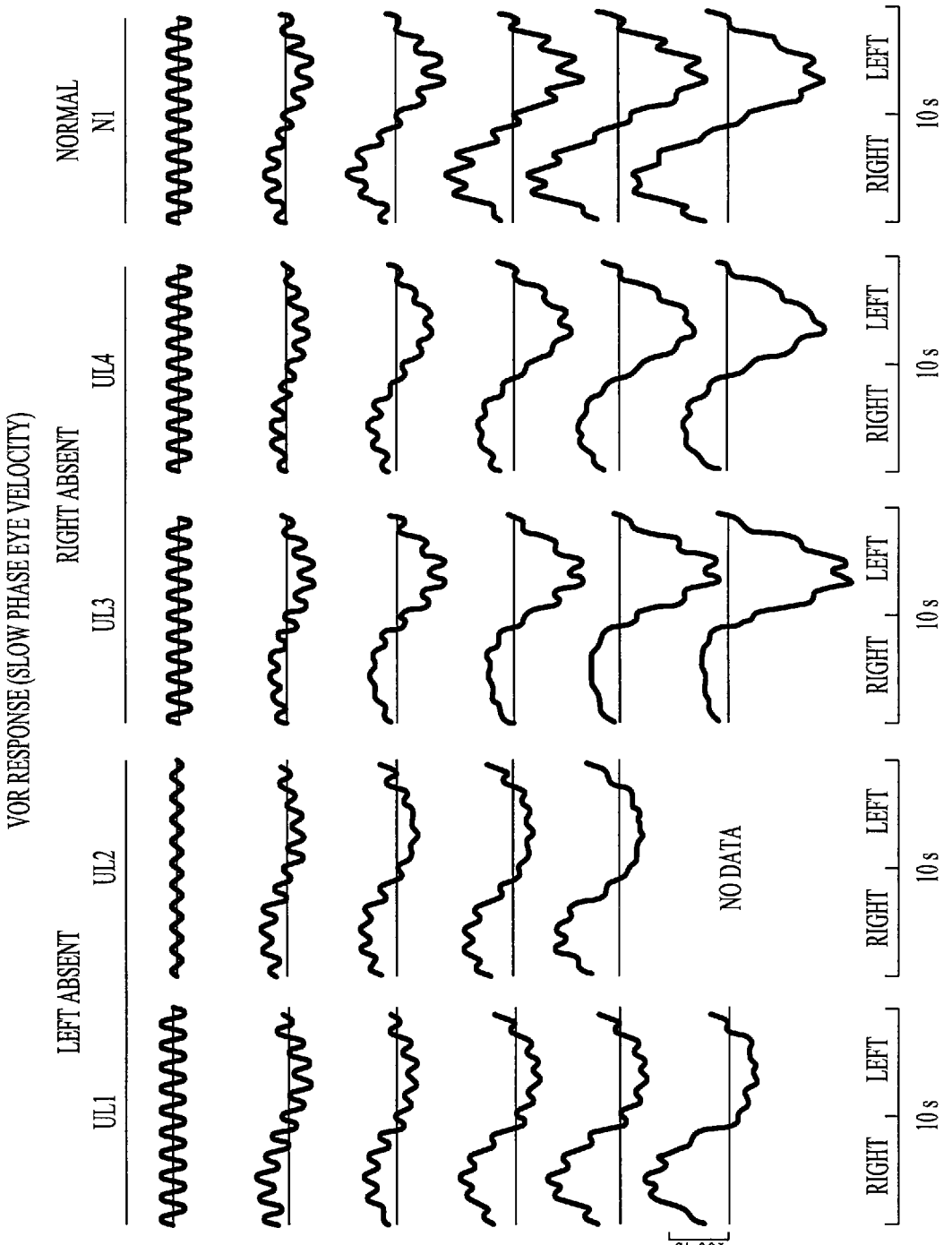


FIG. 8A

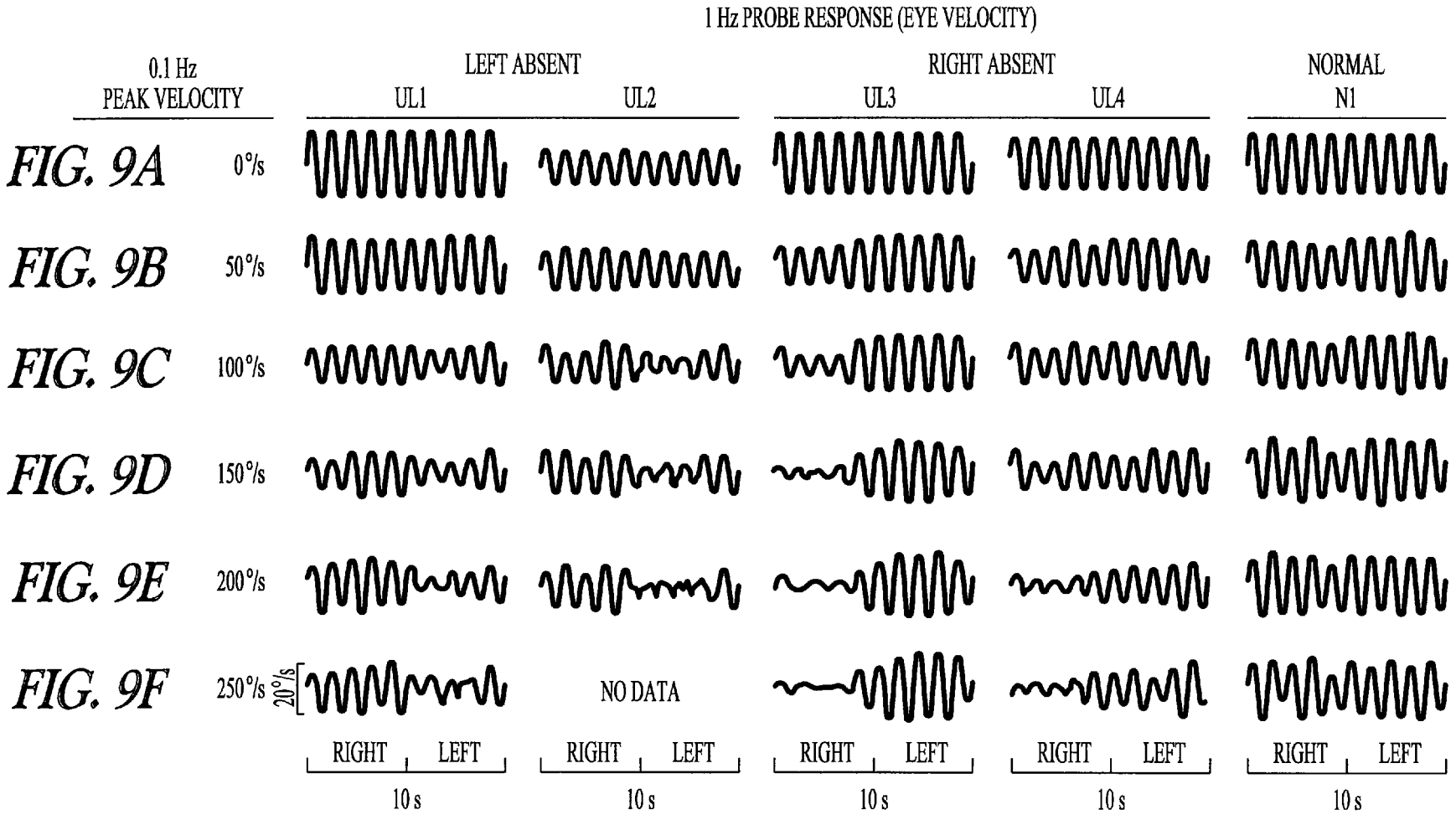
FIG. 8B

FIG. 8C

FIG. 8D

FIG. 8E

FIG. 8F


1 Hz PROBE RESPONSE (EYE VELOCITY)
0.1 Hz PEAK VELOCITY
LEFT ABSENT
RIGHT ABSENT
NORMAL
UL1
UL2
UL3
UL4
N1
FIG. 9A
0°/s
FIG. 9B
50°/s
FIG. 9C
100°/s
FIG. 9D
150°/s
FIG. 9E
200°/s
FIG. 9F
250°/s
20°/s
NO DATA
RIGHT
LEFT
10 s

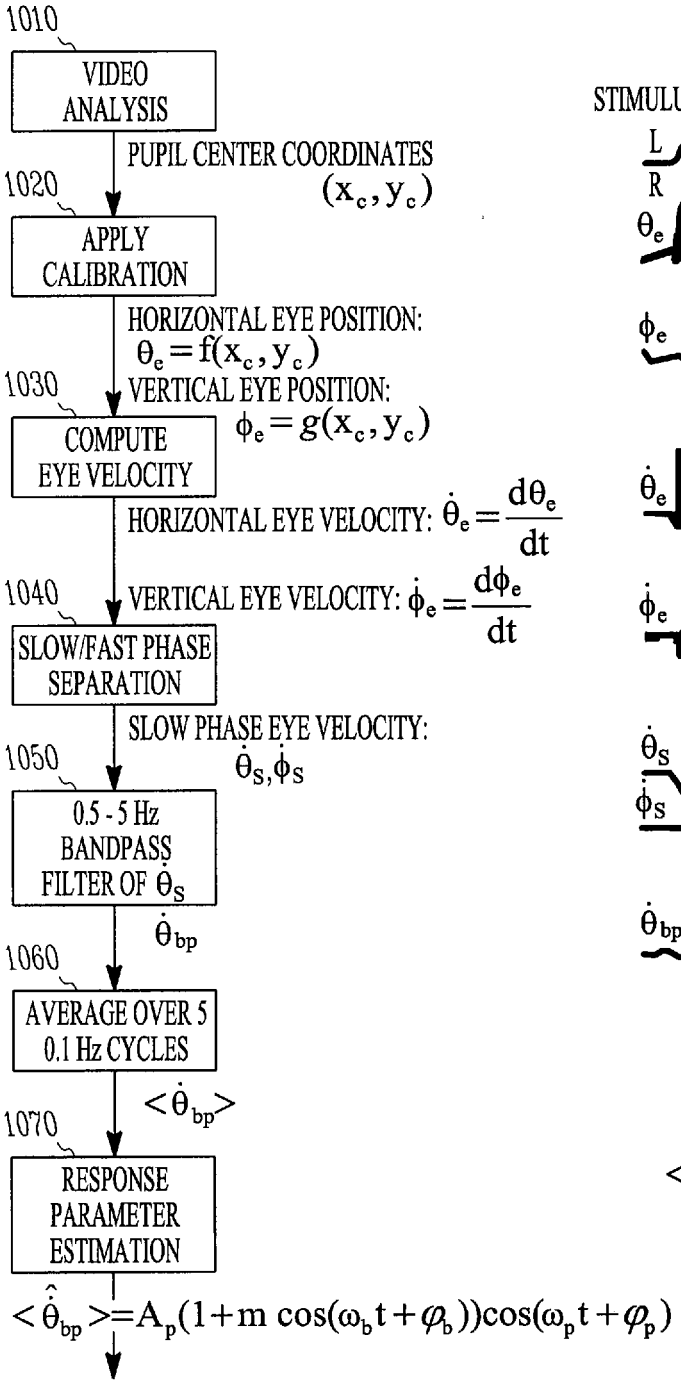


FIG. 10A

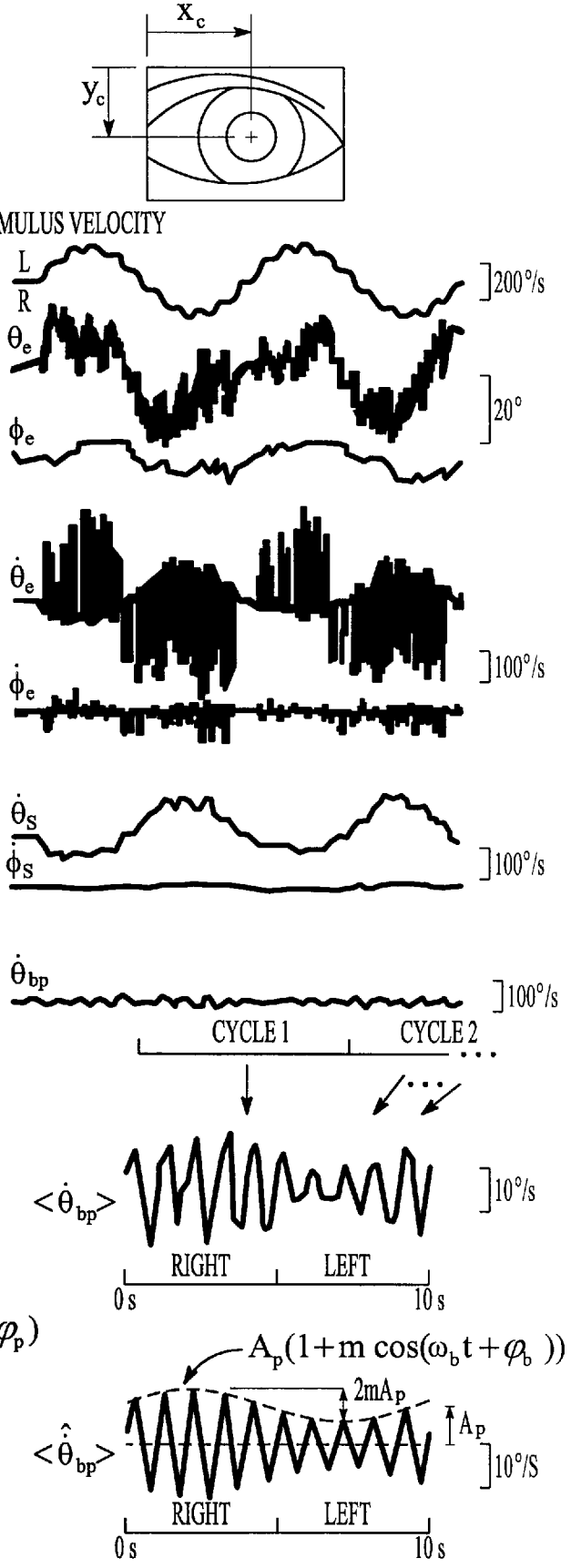


FIG. 10B

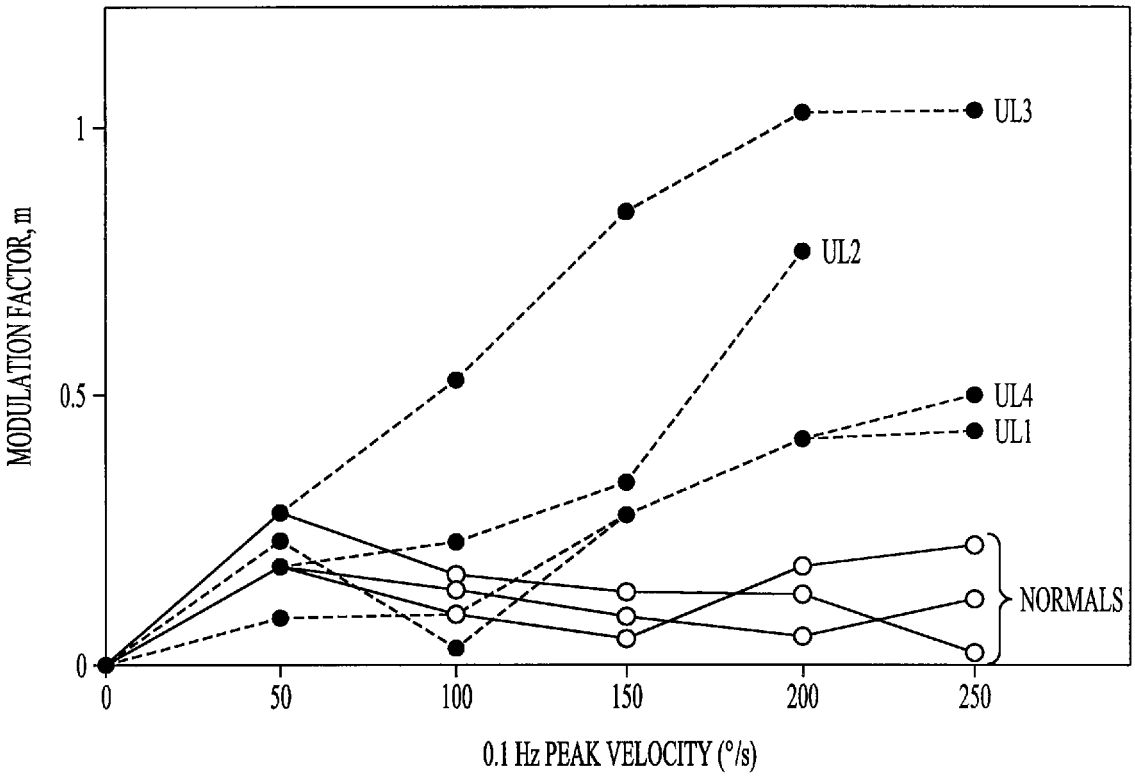

MODULATION FACTOR, m
1
0.5
0
0
50
100
150
200
250
0.1 Hz PEAK VELOCITY (°/s)
UL3
UL2
UL4
UL1
NORMALS

FIG. 11

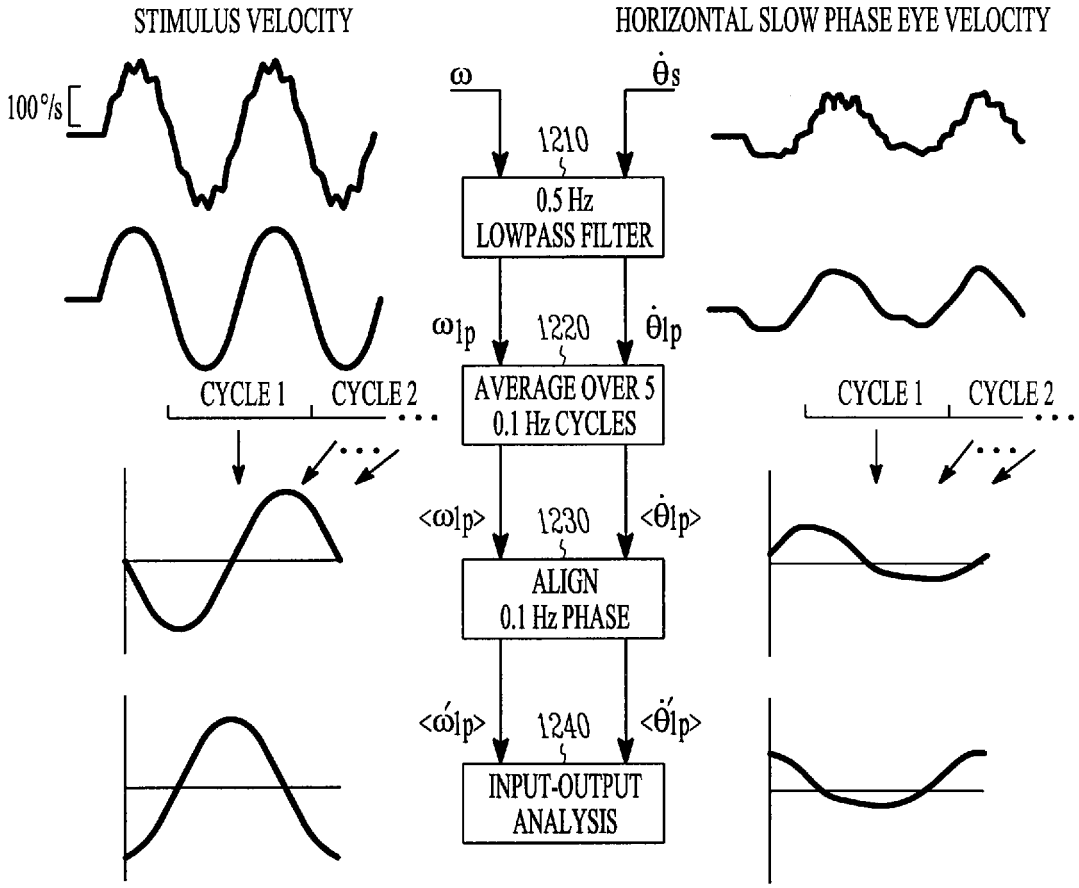

STIMULUS VELOCITY
HORIZONTAL SLOW PHASE EYE VELOCITY
100°/s
ω
θ̇s
1210
0.5 Hz
LOWPASS FILTER
ωlp
1220
θ̇lp
AVERAGE OVER 5
0.1 Hz CYCLES
CYCLE 1
CYCLE 2
<ωlp>
1230
<θ̇lp>
ALIGN
0.1 Hz PHASE
<ώlp>
1240
<θ̈lp>
INPUT-OUTPUT
ANALYSIS

FIG. 12

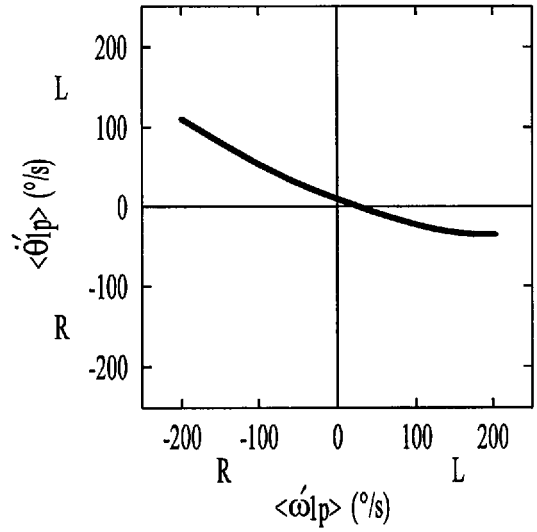

200
L
100
0
-100
R
-200
<θ̇lp> (°/s)
-200
-100
0
100
200
R
L
<ώlp> (°/s)

FIG. 13

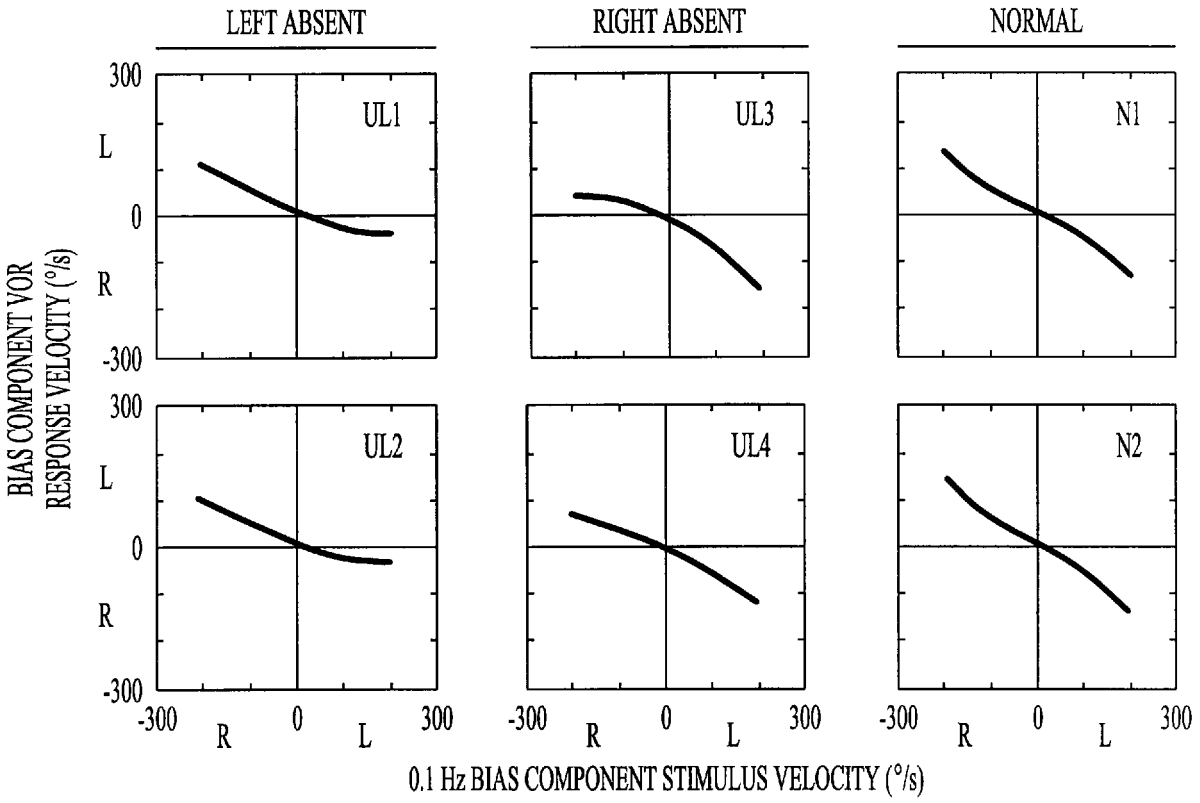

LEFT ABSENT
RIGHT ABSENT
NORMAL
UL1
UL3
N1
UL2
UL4
N2
300
L
0
R
-300
BIAS COMPONENT VOR RESPONSE VELOCITY (°/s)
-300
R
0
L
300
0.1 Hz BIAS COMPONENT STIMULUS VELOCITY (°/s)

FIG. 14

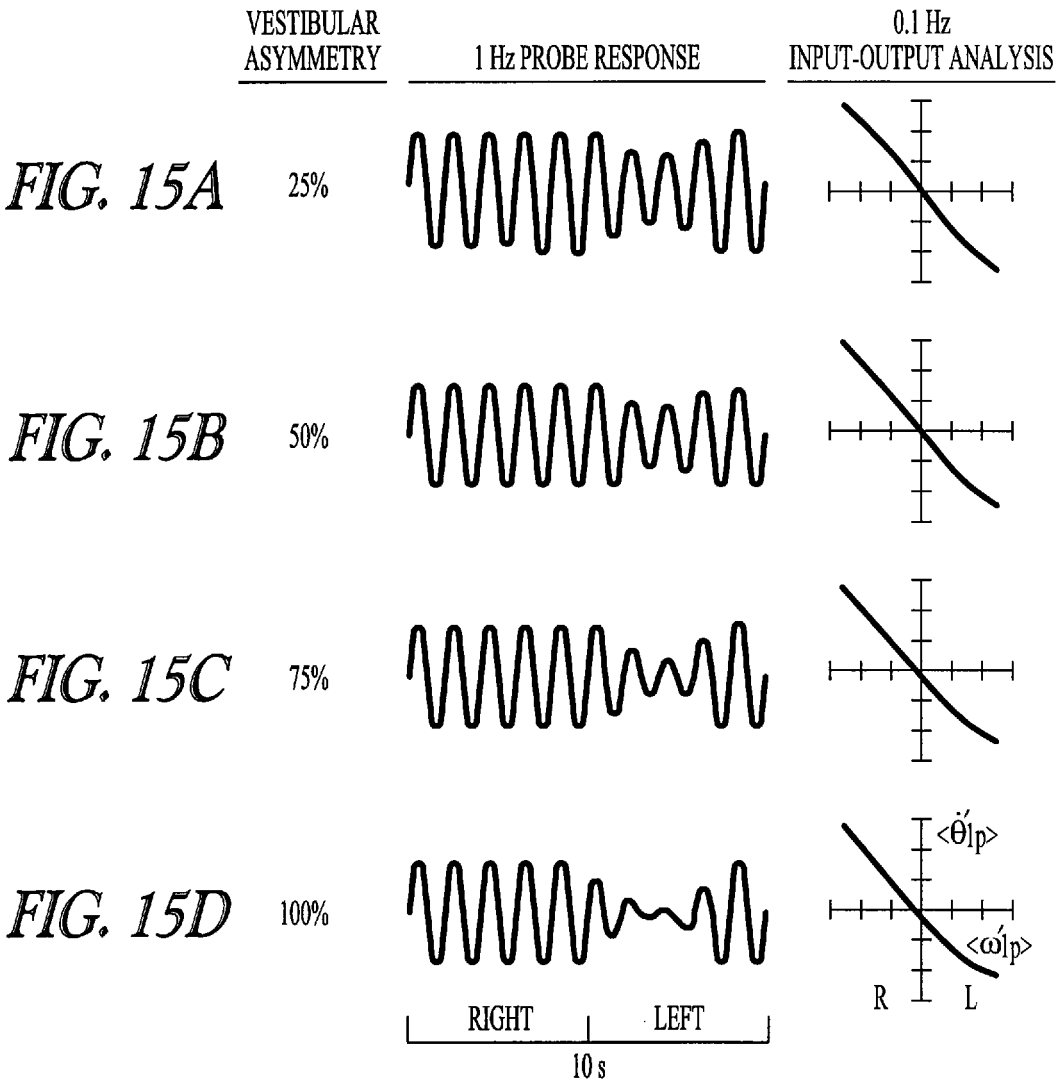


FIG. 15A

FIG. 15B

FIG. 15C

FIG. 15D

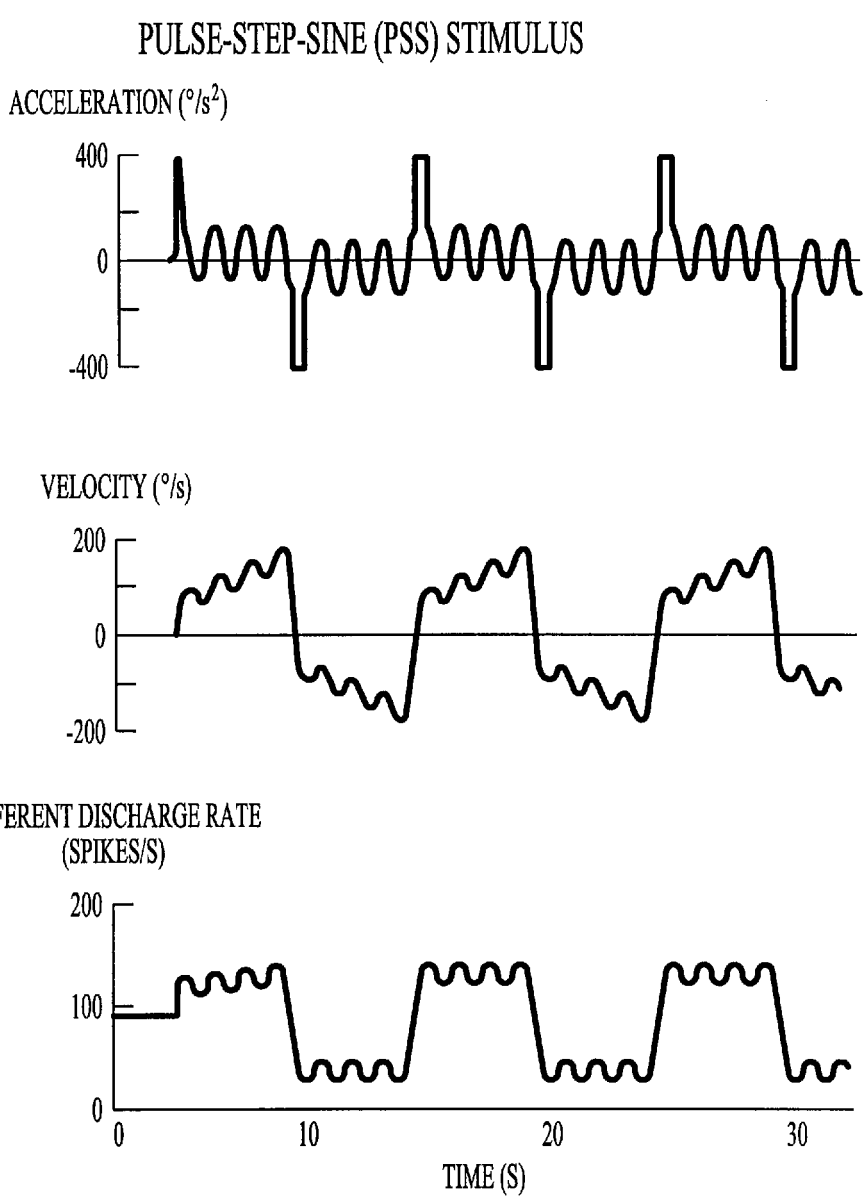


FIG. 16A

FIG. 16B

FIG. 16C

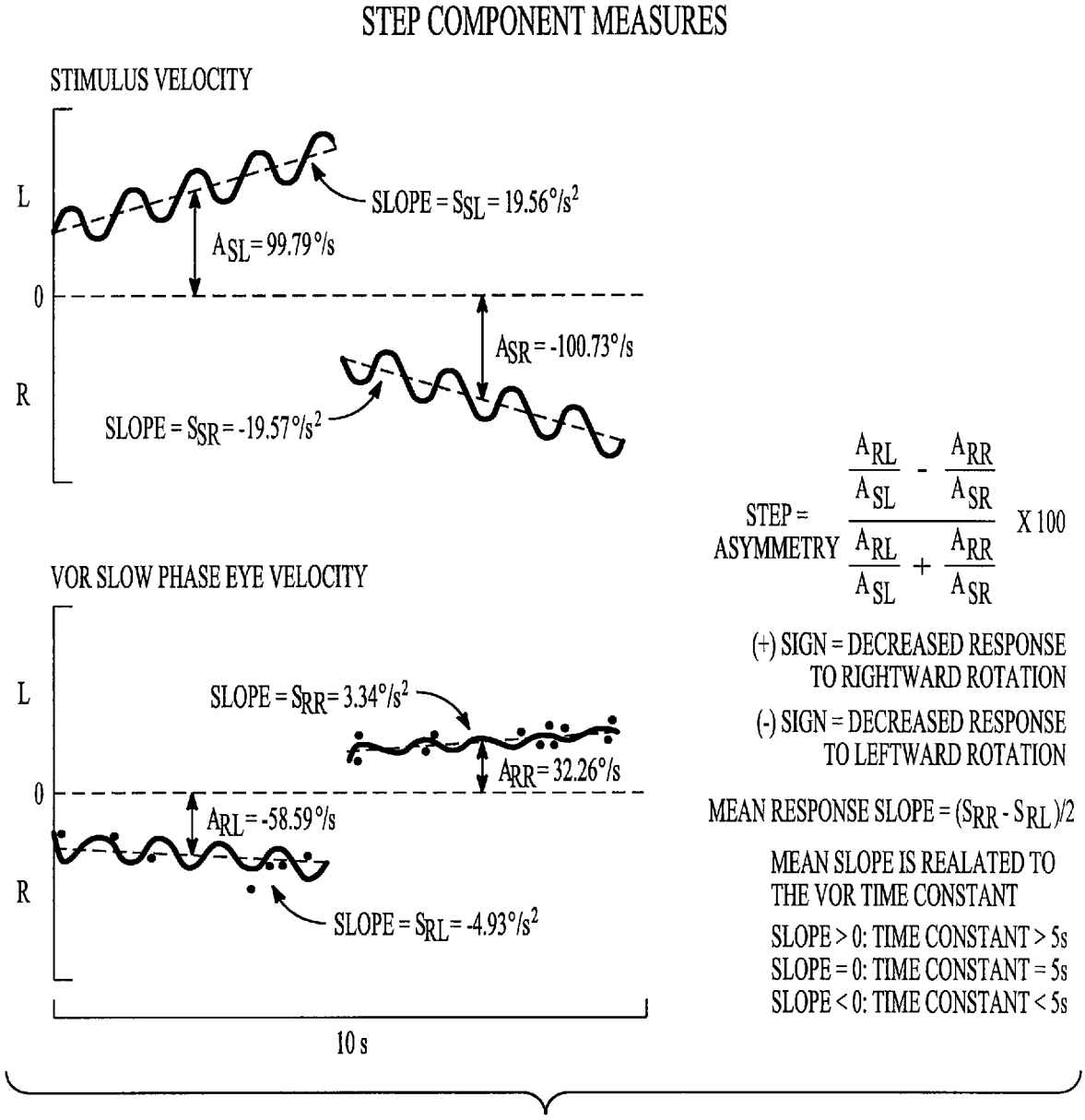
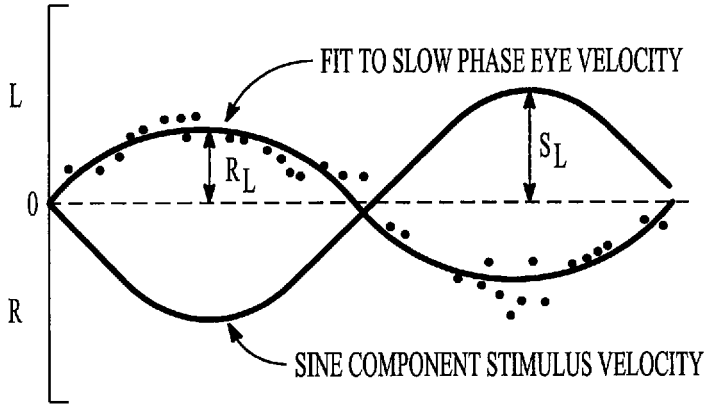

STEP COMPONENT MEASURES
STIMULUS VELOCITY
L
0
R
SLOPE = S_{SL} = 19.56°/s²
A_{SL} = 99.79°/s
A_{SR} = -100.73°/s
SLOPE = S_{SR} = -19.57°/s²
VOR SLOW PHASE EYE VELOCITY
L
0
R
SLOPE = S_{RR} = 3.34°/s²
A_{RR} = 32.26°/s
A_{RL} = -58.59°/s
SLOPE = S_{RL} = -4.93°/s²
10 s
STEP ASYMMETRY = $\frac{\frac{A_{RL}}{A_{SL}} - \frac{A_{RR}}{A_{SR}}}{\frac{A_{RL}}{A_{SL}} + \frac{A_{RR}}{A_{SR}}}$ X 100
(+) SIGN = DECREASED RESPONSE TO RIGHTWARD ROTATION
(-) SIGN = DECREASED RESPONSE TO LEFTWARD ROTATION
MEAN RESPONSE SLOPE = $(S_{RR} - S_{RL})/2$
MEAN SLOPE IS REALATED TO THE VOR TIME CONSTANT
SLOPE > 0: TIME CONSTANT > 5s
SLOPE = 0: TIME CONSTANT = 5s
SLOPE < 0: TIME CONSTANT < 5s

FIG. 17A

SINE COMPONENT MEASURES

SINE RESPONSE DURING LEFTWARD STEP



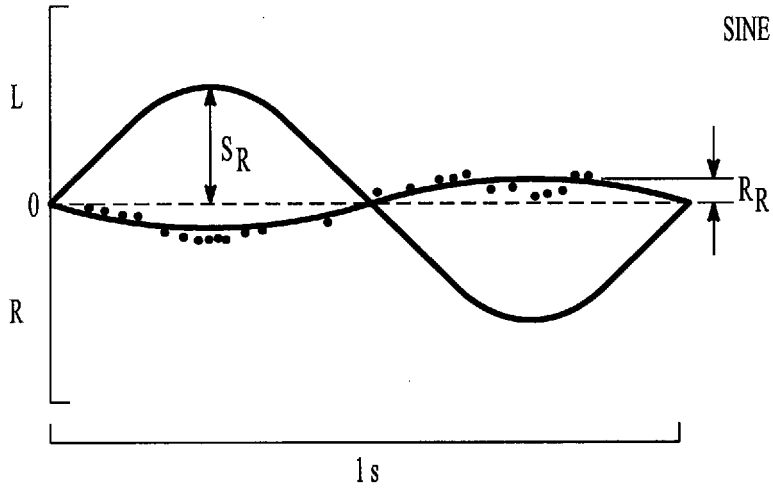
SINE COMPONENT GAIN DURING LEFTWARD STEP

$$VOR_R = \frac{R_L}{S_L}$$

SINE COMPONENT GAIN DURING RIGHTWARD STEP

$$VOR_R = \frac{R_R}{S_R}$$

SINE RESPONSE DURING RIGHTWARD STEP



SINE COMPONENT GAIN ASYMMETRY

$$= \frac{VOR_L - VOR_R}{VOR_L + VOR_R} \times 100$$

(+) SIGN = DECREASED RESPONSE TO RIGHTWARD ROTATION

(-) SIGN = DECREASED RESPONSE TO LEFTWARD ROTATION

FIG. 17B

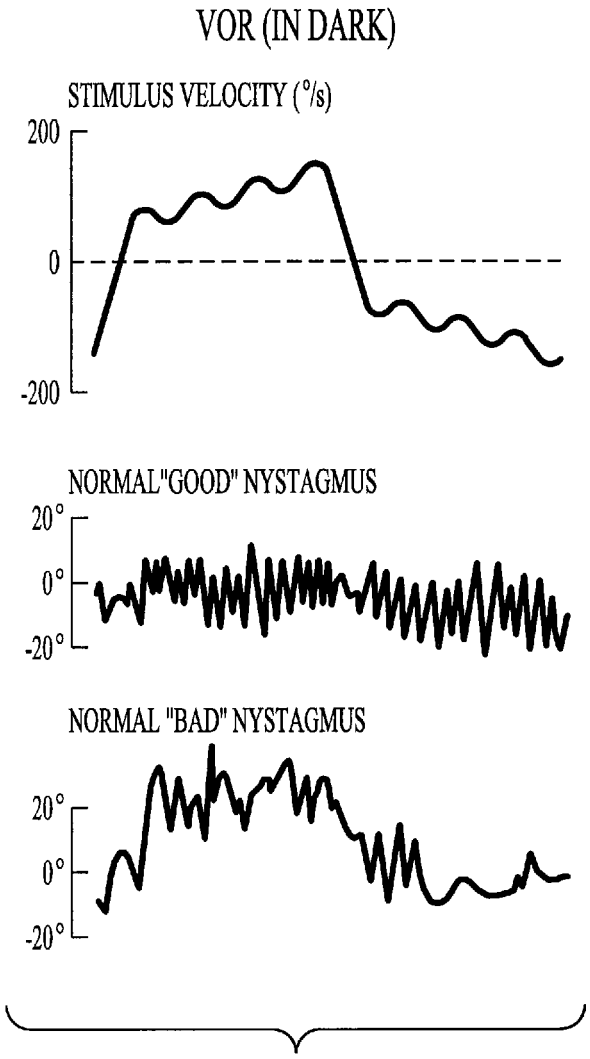


FIG. 18A

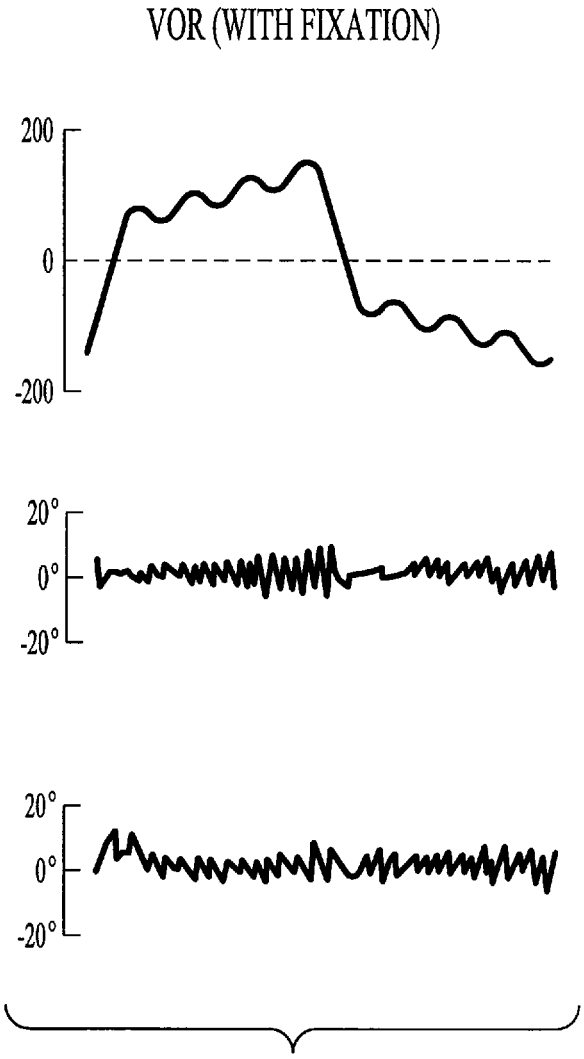


FIG. 18B

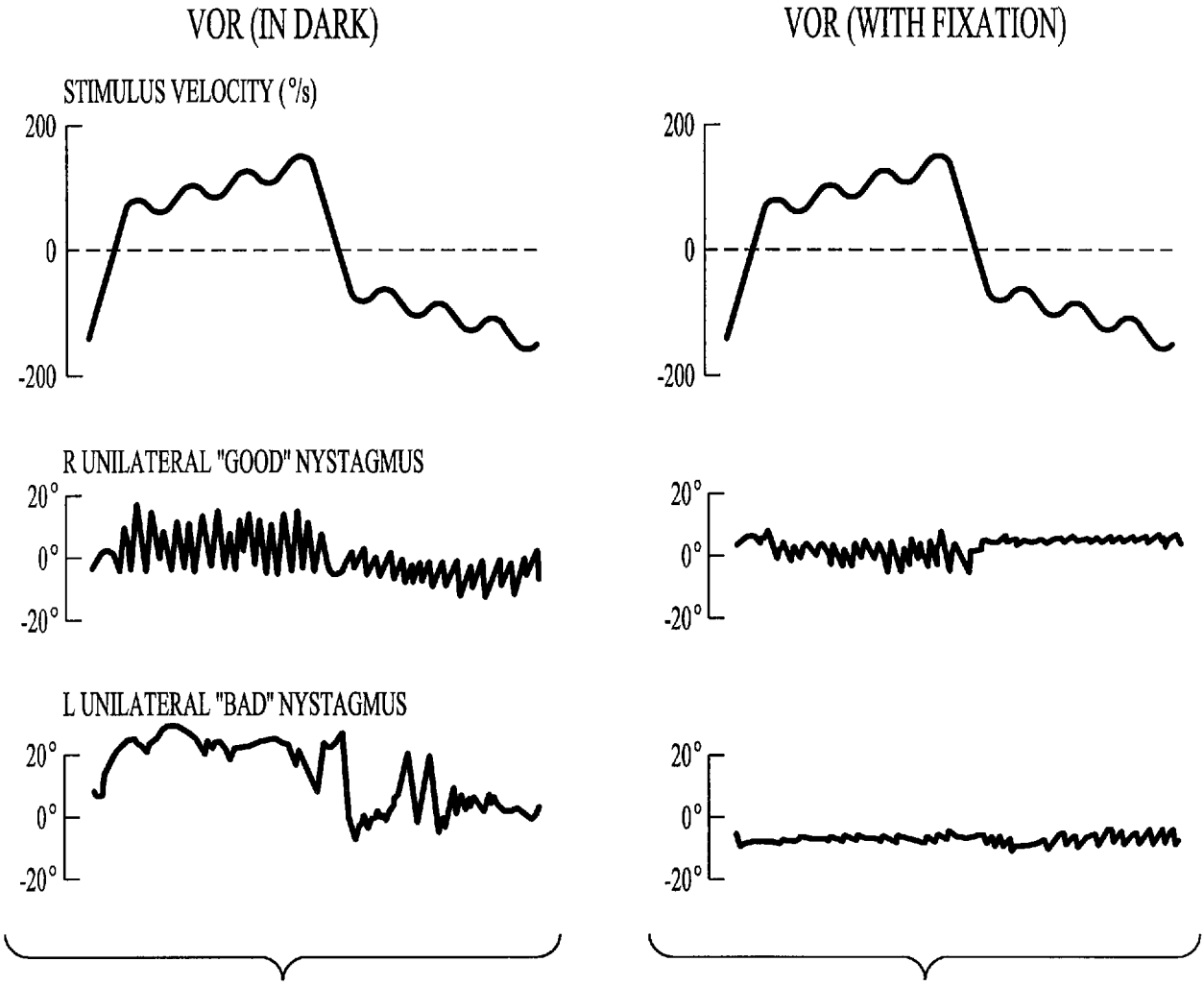


FIG. 19A

FIG. 19B

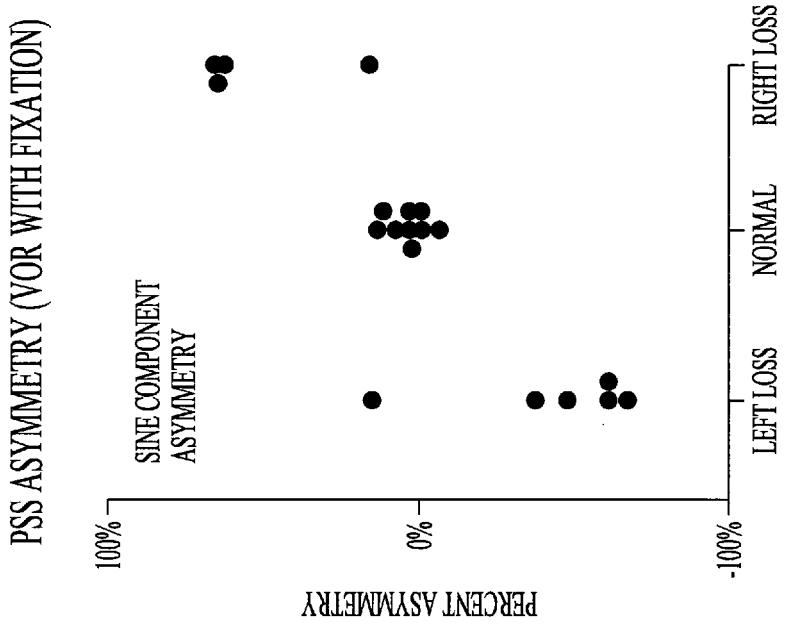


FIG. 20B

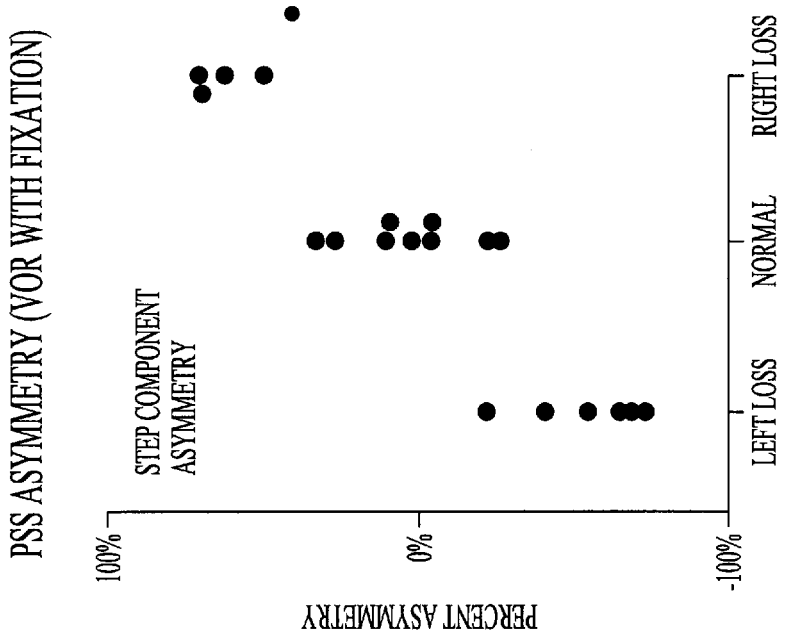


FIG. 20A